

CLAIMS

1. Method for making a fluctuating stream of living poultry in
5 a slaughter line substantially uniform, the slaughterline
comprising an unloading station, a conveying station and a
connecting station, wherein the poultry is delivered to the
unloading station in at least one holder, wherein the poultry is
10 unloaded from the at least one holder in the unloading station
and is transferred to the conveying station, wherein the stream
of poultry is formed, and wherein the conveying station
comprises at least one conveyor device, wherein the stream of
poultry is conveyed in the conveying station and is transferred
15 to the connecting station, where the poultry is connected to
carriers, **characterized in that** the number of birds which is
transferred per time unit to the conveying station by the
unloading station or to the connecting station by the conveying
station is controlled in order to reduce fluctuations in the
stream of poultry.
- 20
2. Method according to claim 1, wherein the stream of poultry
is conveyed at a conveying speed by the at least one conveyor
device to the connecting station, the conveying speed of the at
least one conveyor device being controlled in order to reduce
25 fluctuations in the stream of poultry.
3. Method according to claim 1 or 2, wherein the said stream
of poultry is successively conveyed through a number of separate
conveyor devices which are connected in series, and wherein the
30 number of birds which is transferred from a conveyor device to a
subsequent conveyor device per time unit is controlled in order
to reduce fluctuations in the stream of poultry.
4. Method according to one of claims 1 - 3, wherein the
35 conveying station comprises a number of conveyor devices for a
number of streams of poultry, wherein the poultry is unloaded
from a number of holders, wherein a number of streams of poultry
are formed, wherein each stream of poultry is transported at a
conveying speed by at least one associated conveyor device, and

wherein the conveying speed of each of the conveyor devices is controlled in order to reduce fluctuations in the stream of poultry.

5 5. Method according to claim 4, wherein the said streams are combined before they arrive at the connecting station.

10 6. Method according to claims 4 and 5, wherein the conveyor devices are controlled in order to make the respective streams of poultry substantially uniform during a first time unit and to make them substantially zero during a second time unit, and wherein the streams of poultry are then combined, forming a substantially uniform stream of poultry.

15 7. Method according to one of the preceding claims, wherein a number of birds is unloaded from at least one holder per time unit, and wherein the said number of birds per time unit is controlled in order to reduce fluctuations in the stream of poultry.

20 8. Method according to one of the preceding claims, wherein the poultry is stunned before arriving in the connecting station.

25 9. Method according to one of the preceding claims, wherein the poultry is temporarily stored in at least one first buffer store downstream of the unloading station and upstream of the connecting station.

30 10. Method according to claim 9, wherein a number of birds which is released from the said at least one first buffer store per time unit is controlled in order to reduce fluctuations in the stream of poultry.

35 11. Method according to one of the preceding claims, wherein at least one bird which arrives at the connecting station is temporarily stored in a second buffer store in order to be connected to a carrier when a carrier becomes available.

12. Method according to one of the preceding claims, wherein at least one parameter is measured from a group of parameters which comprises:

- a total weight of the number of birds in the holder,
- 5 - a weight of at least one individual bird in the holder,
- a number of birds which is present in the holder,
- a number of birds which is unloaded from the holder per time unit,
- a temperature of a bird,
- 10 - a total weight of the number of birds on the conveyor device,
- a weight of at least one individual bird on the at least one conveyor device,
- a duration of time between a bird leaving the unloading station and arriving at the connecting station,
- 15 - a conveying speed of the at least one conveyor device,
- a waiting time for a bird at the connecting station,
- a number of birds which is transferred to the conveying station by the unloading station per time unit,
- 20 - a number of birds which is transferred to the connecting station per time unit,
- a number of birds which is delivered to the connecting station within a defined time without a carrier being available for them,
- 25 - a number of carriers which leaves the connecting station per time unit,
- a number of carriers which leaves the connecting station per time unit without a bird being connected to them,
- a number of birds which is present at the connecting station in order to be connected to a carrier,
- 30 - a number of carriers which approaches the connecting station per time unit,
- a number of birds which is present on the conveyor device,
- 35 - a number of birds which passes a predetermined point in the slaughter line per time unit,

forming at least one measured value, the at least one measured value being used to control the number of birds which is transferred to the conveying station by the unloading station or

- 70 -

to the connecting station by the conveying station per time unit.

13. Method according to one of the preceding claims, wherein the poultry is temporarily stored in at least one first buffer store downstream of the unloading station and upstream of the connecting station, and wherein at least one parameter is measured from a group of parameters which comprises:

- a number of birds which is temporarily stored, and
- a change in the number of birds which is temporarily stored,

forming at least one measured value, the at least one measured value being used to control the number of birds which is transferred to the conveying station by the unloading station or to the connecting station by the conveying station per time unit.

14. Method according to claim 12 or 13, wherein a number of parameters is measured, and wherein a number of criteria are linked to the measured parameters, each criterion being assigned a predetermined priority, and a method of control being defined in advance for each criterion, the number of birds which is transferred to the conveying station by the unloading station or to the connecting station by the conveying station per time unit being controlled on the basis of a criterion which is satisfied, and wherein in the case that a plurality of criteria are satisfied, the priority of the criterion is used for determining which criterion to used for the control.

15. Method according to one of claims 12 - 14, wherein at least one of the said measured values is used to control the conveying speed of the at least one conveyor device.

16. Method according to one of claims 12 - 15, wherein at least one of the said parameters is measured, and wherein the at least one measured value is used to control the number of birds which is unloaded from the at least one holder per time unit.

17. Method according to one of claims 12 - 16, wherein at least

one of the said parameters is measured, and wherein the at least one measured value is used to control the number of birds which is released from the at least one first buffer store per time unit.

5

18. Method according to one of the preceding claims, wherein a number of conveyor devices are arranged in a series, the number of birds which is transferred from a first conveyor device to a subsequent conveyor device per time unit being controlled on the basis of a parameter which is selected from the group which comprises:

10

- a number of birds which is present on a conveyor device located downstream of the first conveyor device; and
- a number of birds which is present on a conveyor device

15

located upstream of the first conveyor device.

19. Method according to claim 18, wherein the number of birds which is transferred from a conveyor device to a subsequent conveyor device per time unit is controlled on the basis of the number of birds which is located in a predetermined section of a conveyor device.

20

20. Method according to one of claims 12 - 19, wherein two or more of the said measured values are compared with one another, the result of the comparison being used to control the number of birds which is transferred to the conveying station by the unloading station or to the connecting station by the conveying station per time unit.

25

21. Method according to claim 20, wherein a measured value for the number of birds which passes a defined point in the slaughter line per time unit is compared with a measured value for the number of birds or carriers which leaves the connecting station per time unit.

30

35

22. Method according to claim 20, wherein the number of birds which arrives at the connecting station per time unit is compared with the number of birds which leaves the connecting station per time unit.

23. Method according to claim 20, wherein the number of birds which passes a defined point in the slaughter line upstream of the connecting station per time unit is compared with a number of carriers which passes a defined point in the connecting station per time unit.

24. Method according to one of claims 12 - 23, wherein a predetermined time unit lies between the instant at which a measurement is carried out and the instant at which a measured value derived from this measurement is used.

25. Method according to one of claims 12 - 24, wherein at least one said measured value is compared with a predetermined set value for this parameter in order to control the number of birds which is transferred to the conveying station by the unloading station or to the connecting station by the conveying station per time unit.

26. Method according to one of the preceding claims, wherein the poultry is unloaded from the at least one holder by hand, by at least one unloading device at an unloading speed.

27. Method according to claim 26, wherein the at least one unloading device receives information for controlling an unloading speed for the poultry.

28. Method according to claim 27, wherein the unloading device receives visual information for controlling an unloading speed of the poultry.

29. Method according to one of claims 1 - 27, wherein the poultry is unloaded mechanically from the at least one holder.

30. Method according to claim 29, wherein an unloading device is introduced into a holder, and wherein the unloading device moves the poultry out of the holder.

31. Method according to claim 30, wherein the unloading device

- 73 -

is moved into the holder above the poultry which is to be unloaded.

32. Method according to claim 1, wherein a shield is arranged at the unloading station, and wherein a number of compartments of a holder which comprises a plurality of compartments is opened, and wherein the shield holds the poultry inside one or more opened compartments.

33. Method according to one of the preceding claims, wherein in the unloading station birds are connected to carriers in a number of connecting lines.

34. Method according to one of the preceding claims, wherein the bird, as it is being conveyed, is positioned by orientation means arranged in the vicinity of the at least one conveyor device, in such a manner that the breastbone of the bird is positioned in a predetermined orientation with respect to a conveying direction.

35. Method according to claim 34, wherein the orientation of the breastbone of the bird is substantially perpendicular to the conveying direction.

36. Method according to one of the preceding claims, wherein the number of birds which is transferred to the conveying station by the unloading station or to the connecting station by the conveying station per time unit is adjusted using minor changes or substantially continuously.

37. Method according to one of the preceding claims, wherein in the unloading station a number of birds is unloaded from a holder in a first period of time, with the stream of poultry being controlled in order for the number of birds to be transferred to the connecting station in a second period of time, the second period of time being of a different length from the first period of time.

38. Device for converting a stream of living poultry which

- 74 -

fluctuates' over the course of time into a stream of living poultry which is substantially uniform over the course of time in a slaughter line, the device comprising at least the following stations:

- 5 - an unloading station for unloading the poultry from at least one holder,
- a connecting station for connecting the poultry to carriers,
- 10 - a conveying station for conveying the poultry as a stream of poultry from the unloading station to the connecting station, the conveying station comprising at least one conveyor device,

15 **characterized in that** the device comprises at least one control device which is constructed to control the number of birds which is transferred from the unloading station to the conveying station or from the conveying station to the connecting station per time unit, in order to reduce fluctuations in the stream of poultry.

20 39. Device according to claim 38, wherein the poultry, in the unloading station, is unloaded from the at least one holder by at least one unloading device.

25 40. Device according to claim 39, wherein the control device is linked to the at least one unloading device in order to control a number of birds which is unloaded from the at least one holder per time unit.

30 41. Device according to claim 39 or 40, wherein a number of unloading devices are arranged in parallel.

35 42. Device according to one of claims 38 - 41, wherein the at least one conveyor device is constructed to convey the poultry at a conveying speed, the control device being linked to the at least one conveyor device and being constructed to control the conveying speed of the at least one conveyor device in order to reduce fluctuations in the stream of poultry.

43. Device according to claim 42, wherein the conveying station

comprises a number of conveyor devices arranged in parallel.

44. Device according to claim 43, wherein a number of conveyor devices convey the poultry from the unloading station to a collection-conveyor device, and wherein the collection and conveyor device conveys the poultry to the connecting station at a speed.

45. Device according to claim 44, wherein the control device is constructed to control the number of birds which is transferred from the at least one conveyor device to the collection-conveyor device per time unit, in order to reduce fluctuations in the stream of poultry.

46. Device according to claims 42 - 45, wherein the conveying station comprises a number of conveyor devices connected in series.

47. Device according to claim 46, wherein the control device is constructed to control the number of birds which is transferred from a conveyor device to a subsequent conveyor device per time unit, in order to reduce fluctuations in the stream of poultry.

48. Device according to one of claims 38 - 47, wherein at least one first buffer storage member for the temporary storage of poultry is arranged downstream of the unloading station and upstream of the connecting station.

49. Device according to claim 48, wherein the control device is linked to the at least one buffer storage member in order to control a number of birds which is released from the at least one first buffer storage member per time unit.

50. Device according to one of claims 38 - 49, wherein a stunning station is arranged upstream of the connecting station.

51. Device according to one of claims 38 - 50, wherein a second buffer storage member, for temporarily storing birds which have been delivered to the connecting station and for which no

carrier is available, is positioned in the connecting station.

52. Device according to one of claims 34 - 47, wherein the unloading station comprises at least one sensor which measures
5 at least one parameter relating to the unloading, which parameter is preferably selected from a group of parameters which comprises:

- a number of birds which is unloaded from the holder per time unit,
- 10 - a weight of a total number of birds in the holder,
- a weight of at least one individual bird in the holder,
- a number of birds present in the holder, and
- a temperature of a bird,

resulting in at least one measured value, the at least one
15 measured value being fed to the control device in order to control the number of birds which is transferred from the unloading station to the conveying station or from the conveying station to the connecting station per time unit, in order to reduce fluctuations in the stream of poultry.

20 53. Device according to one of claims 38 - 52, wherein the conveying station comprises at least one sensor which is constructed to measure at least one parameter relating to the conveying, which parameter is preferably selected from a group
25 of parameters which comprises:

- a number of birds which passes a defined point on the conveyor device per time unit,
- a weight of the total number of birds on the at least one conveyor device,
- 30 - a weight of at least one individual bird on the at least one conveyor device,
- a duration of time between a bird leaving the unloading station and arriving at the connecting station,
- a conveying speed of a stream of poultry, and
- 35 - a number of birds which is present on the conveying member,

resulting in at least one measured value, the at least one measured value being fed to the control device in order to control the number of birds which is transferred from the

- 77 -

unloading station to the conveying station or from the conveying station to the connecting station per time unit, in order to reduce fluctuations in the stream of poultry.

- 5 54. Device according to one of claims 38 - 53, wherein the connecting station comprises at least one sensor which is constructed to measure at least one parameter relating to the connecting of the birds to the carrier, which at least one parameter is preferably selected from a group of parameters
- 10 which comprises:
- a waiting time for a bird at the connecting station,
 - a number of birds waiting at the connecting station,
 - a number of birds which is delivered to the connecting station per time unit,
 - 15 - a number of carriers which leaves the connecting station per time unit,
 - a number of carriers which leaves the connecting station per time unit without a bird having been connected to them,
 - 20 - a number of birds which is delivered to the connecting station per time unit without a carrier being available for them,
 - a number of birds present at the connecting station for connection to a carrier, and
 - 25 - a number of carriers which is approaching the connecting station per time unit,

resulting in at least one measured value, the at least one measured value being fed to the control device in order to control the number of birds which is transferred from the unloading station to the conveying station or from the conveying station to the connecting station per time unit, in order to reduce fluctuations in the stream of poultry.

30

- 35 55. Device according to one of claims 52 - 54, wherein the said at least one sensor is linked to the control device, and wherein the control device is linked to the at least one conveyor device, and wherein the said measured values are fed to the control device in order to control the at least one conveyor device.

56. Device according to one of claims 52 - 55, wherein the said at least one sensor is linked to the control device, and wherein the control device is linked to the at least one unloading device, and wherein the said measured values are fed to the control device in order to control the at least one unloading device.

57. Device according to one of claims 52 - 56, wherein the said at least one sensor is linked to the control device, and wherein the control device is linked to the at least one first buffer storage member, and wherein the said measured values are fed to the control device in order to control the at least one first buffer storage member.

58. Device according to one of claims 38 - 57, wherein the at least one conveyor device is a conveyor belt.

59. Device according to one of claims 39 - 57, wherein the unloading station comprises a tilting device for tilting the at least one holder, wherein the poultry leaves the holder under the influence of the force of gravity.

60. Device according to claim 59, wherein the control device is constructed to control the tilting of the tilting device.

61. Device according to one of claims 39 - 58, wherein the at least one unloading device comprises an arm which can move into the at least one holder.

62. Device according to claim 61, wherein the control device is constructed to control the arm of the unloading device.

63. Device according to one of claims 52 - 62, wherein the said at least one sensor is preferably selected from a group which comprises:

- a pivotable body,
- a measuring instrument for measuring a weight,
- a measuring instrument for measuring infrared radiation,

and

- an optical measuring instrument.

64. Device according to one of claims 52 - 63, wherein the at least one conveyor device extends over a defined distance, and wherein the at least one conveyor device has an upstream side and a downstream side, and wherein the at least one sensor is arranged on the downstream side of the at least one conveyor device.

65. Device according to one of claims 61 - 64, wherein the arm comprises a first conveyor belt.

66. Device according to one of claims 39 - 65, wherein the unloading device comprises a second conveyor belt, which can be moved into a position above the poultry which is to be unloaded, and wherein the said second conveyor belt is constructed to unload the poultry from the holder..

67. Device according to claim 66, wherein the said conveyor belt of the unloading device comprises projections for advancing the poultry.

68. Device according to claim 67, wherein the said projections are flaps.

69. Device according to one of claims 38 - 68, wherein the connecting station comprises a number of connecting lines.

70. Device according to claim 69, wherein a conveyor in part follows two different paths, a first path running along a connecting line while a second path does not run along a connecting line, and wherein the conveyor is constructed to enable carriers to follow the first or second path depending on a predetermined selection.

71. Device according to one of claims 38 - 66, wherein the device is configured so as to adjust the number of birds which is transferred to the conveying station by the unloading station

or to the connecting station by the conveying station per time unit using minor changes or substantially continuously.